MARGINAL THEORY AND BUSINESS BEHAVIOR
A CASE STUDY

by

MILDRED ERICKSON BUZENBERG

B. A., Michigan State College, 1938

A THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Department of Economics and Sociology

KANSAS STATE COLLEGE
OF AGRICULTURE AND APPLIED SCIENCE

1951

Documents
LD
2668
T4
1951
B89
c.2

TABLE OF CONTENTS

INTRODUCTION 1
The Controversy 1
Objective 2
Scope and Method 3
ANALYSIS OF THE LITERATURE 4
Marginal Theory 4
Objections to the Marginal Theory 5
Professor M. W. Reder 7
Professor R. A. Gordon 9
Professor Wilford J. Eiteman 12
Professor R. A. Lester 14
Alternatives to the Marginal Theory 16
Turnover Theory 17
Average Cost Theory 26
Theory of Games 27
Defense of Marginalism 28
CASE STUDY--VIKING MANUFACTURING COMPANY 36
Aim of the Enterprise 36
Market Structural Factors 37
Demand for Viking Elevators 40
Cost Analysis of the Viking Elevator 42
Pricing Analysis of the Viking Elevator 45
CONCLUSIONS 50
Aim of the Enterprise 50
Market Structural Factors 51

Demand for Viking Elevators. 52
Cost Analysis of the Viking Elevator 53
Pricing Analysis of the Viking Elevator. 54
Summary. 55
QUESTIONS ASKED IN INTERVIEWS 57
ACKNOWLEDGMENT. 61
LITERATURE CITED. 62

INTRODUCTION

The Controversy

At present a controversy is raging among economists regarding the applicability of marginal analysis to business behavior. The time-honored theory of individual firm adjustment to equilibrium through the equating of marginal cost and marginal revenue is being attacked as unrealistic. Its profit maximization postulates are being challenged and the practical feasibility of applying the theory in actual dynamic business situations is being denied. The assault on marginalism is nourished by a number of empirical studies of business practice which have yielded some contrary evidence.

The traditional theory is not lacking for staunch defenders who maintain that it has never been more than a broad general principle which can only be approximated in practice in any case and that it is still valid in this sense. They deny that the empirical studies have conclusively refuted the theory and question the scientific value of the studies.

There are two main types of objections to the marginal theory. One attacks the assumption that business men attempt to follow an output and price policy which will maximize profits. The other questions the feasibility of determining marginal revenue and marginal cost. It is contended that the calculation of marginal revenue depends on knowledge of demand which business men seldom have and which is virtually impossible to obtain. The

determination of marginal cost also offers difficulties, particularly in multi-product enterprises.

Not all of the criticisms of marginalism have been negative in character. At least two alternative theories have been presented.

Objective

This paper will attempt to explain the position of some of the present day economists with respect to the marginal controversy. Some of the alternative theories will be explained.

Through the medium of a case study of a small manufacturing company, it is hoped a conclusion can be reached as to which, if any, combination of pricing theories most closely describes the practice of this one company. The firm to be analyzed is the Viking Manufacturing Company located in Manhattan, Kansas. This company manufactures farm machinery for the midwestern market and employs from 75 to 100 men and women. It has been in the farm machinery business since 1935 and moved its business from Jackson, Michigan to Kansas in 1945. It has two principal products. One is a feed grinder of hammer-mill type manufactured in three models. These are a small electric automatic model, a medium-sized tractor power take-off model, and a large-sized tractor power take-off grinder. The other product is a farm elevator which will elevate grains, baled hay, or corn into storage bins, lofts, or stacks.

For the purposes of this paper, the study will be based upon the elevator production only. The farm elevator has been

developed and produced since 1945, and sales were promoted to the point where the Viking Manufacturing Company was seventh largest producer of all farm elevators sold in the United States last year - 1950.

An analysis of one firm's methods of pricing and output determination will doubtless do little to throw light on the marginal controversy, but perhaps it will add another bit of information to the empirical research attempting to determine how business firms do behave.

Scope and Method

The case study method employed is one of personal interviews with the management of the Viking Manufacturing Company. The results of these interviews are recorded in a question and answer form. Comments and conclusions by the writer are withheld until all questions and answers have been documented.

The final portion of the paper is devoted to an analysis of the answers given, and an attempt to determine whether the practices of this organization conform to any economic hypothesis.

ANALYSIS OF THE LITERATURE

Marginal Theory

Marginal theory has developed as a logical outcome of the profit maximization principle. It was developed originally as an explanation of business behavior under conditions of competition. Producing for a purely competitive market, a firm would adjust output to a price set by the forces of demand and supply in such a way as to maximize profits. Subsequently the marginal theory has been expanded to include explanations of firm adjustments under conditions of imperfect competition.

Marginal cost is defined as the change in total cost occuring with the production of each additional unit of output. Marginal revenue is the change in total revenue as an additional unit is sold. If business men's aim is to make all the profit possible, they will produce an output most nearly approaching the point where their marginal cost is equal to their marginal revenue. At this point the firm is producing all the units which net a return greater than cost to produce; i.e., marginal revenue is above marginal cost. It is producing no units which cost more than they return; i.e., marginal cost is above marginal revenue. So at this point profits are maximized. The price at this output would be indicated by the demand for the good.

The usual slopes of cost curves and demand curves used to illustrate the principle of equating marginal cost and marginal revenue are shown below in Fig. 1.

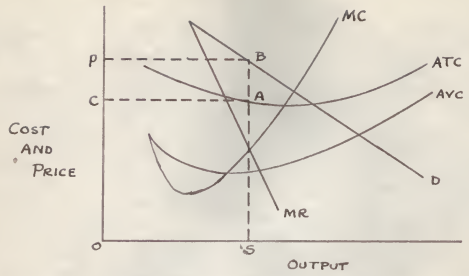

Fig. 1. Individual firm under imperfect competition.

In this particular illustration, an output of OS is indicated, the price is OP, the cost per unit is OC, the profit per unit is CP, and the total profit from operations is represented by the area CABP. No other combination of price, cost, and output can be found on this chart in which the area of the profit rectangle would be as large as the one shown.

Objections to the Marginal Theory

There are two main types of objections to the marginal theory. One objection attacks the basic assumption of profit maximization. The other points out the unfeasibility of determining marginal revenue and marginal cost in actual business practice.

Those who object to the assumption of profit maximization contend that most firms prefer "satisfactory" profit combined with a growth in future stability. Professor M. W. Reder has advanced several reasons why an aim of satisfactory profits

appears to describe actual business behavior in a majority of cases.[1] Among these reasons are avoidance of managerial activity, routine behavior on the part of management, and establishment of good will.

Professor R. A. Gordon's principal reason for breaking away from the marginal theory is his belief that the marginal theory is based upon unrealistic assumptions.[2] Besides disagreeing with the profit maximization assumption, Professor Gordon criticizes the assumption that business men can adjust to changes as they occur. He says adjustments in several directions, such as output, sales efforts, product differentiation, and price, as must be made in actual business practice, do not lend themselves easily to the principle of equating marginal cost and marginal revenue. These are all variables which could influence either marginal cost or marginal revenue and changes in them occur too rapidly for adjustments to take place one at a time.

Professor R. A. Lester objects to marginal analysis as it applies to determination of employment in the individual firm.[3] He conducted a survey of 43 firms from which he concluded that firms base their employment on market demand for the product, rather than on marginal productivity of the workers.

Professor Wilford Eiteman has pointed out the difficulties

---

[1] M. W. Reder, "A Reconsideration of the Marginal Productivity Theory," Journal of Political Economy, 55:450-458, October, 1947.

[2] R. A. Gordon, "Short Period Price Determination," American Economic Review, 38:265-288, June 1948.

[3] R. A. Lester, "Shortcomings of Marginal Analysis for Wage Employment Problems," American Economic Review, 36:63-82, March 1946.

in determining marginal cost in multi-process industry.[1] He objects to the marginal theory's assumption that business men restrict output to increase profits, but claims instead that business men attempt to lower unit costs by pushing production as close to "capacity" output as possible.

A more detailed explanation of each economist's position is given below.

Professor M. W. Reder. Basing his comments upon general observation of business behavior, Professor Reder objects to the assumption that business firms' aim is to maximize profits. He has presented several alternatives which might be taken as objectives of entreprenurial behavior. None of these hypotheses explains the behavior of all firms in the economic system, or in any specific part, but each may be appropriate as an explanatory principle for particular firms at particular times.

Professor Reder claims that the most frequent objective of business men is that of satisfactory profits. He says that corporation managers will often permit considerable inefficiency so long as the profit and loss statement is satisfactory.

There is nothing which requires the manager of a large corporation to make the greatest possible profit for stockholders so long as he makes enough to satisfy them. Often a firm will rationalize its policies in terms of the "long run interests of the

---

[1] Wilford J. Eiteman, "Equilibrium of the Firm", Quarterly Journal of Economics, 59:280-286, February 1945.

company", or "the establishment of good will", but Professor Reder says, "these formal curtsies to the canons of good business should not always be taken at face value."[1] When there are restrictions on entry of firms into an industry and hence competition does not keep prices down to a cost level, departures from greatest efficiency become possible and perhaps frequent. It was the assumption of pure competition that gave the profit maximization hypothesis its great plausibility.[2]

Some of the factors which might make an objective of satisfactory profits adequate are listed by Professor Reder. Perhaps the simplest case occurs when the owner-manager of a sole proprietorship desires to avoid managerial activity in order to spend less time at his business, or to work less intensively.

There are some less obvious ways. For example, managerial activity often involves disturbing the established routines of colleagues and subordinates. More frequently in large corporations is found the reluctance of minor functionaries to disturb the routines of a superior, even though they can see the possibilities of improvements in methods of production.

In lower management circles such as foremen or department superintendents, it is known that restriction of output is tolerated or even encouraged in order to prevent lay-offs or to avoid reduction in piece rates.

---

[1] Reder, op.cit., p 453

[2] For further information see: Edwin G. Nourse, Price Making in a Democracy, Washington D. C., The Brookings Institution, 1944, 541 p.

All of the above alternatives to the basic assumption that the business man always seeks to maximize profit appear to bear out the statement that the primary aim of a business man is to stay in business and obtain satisfactory profits in the long run. If the business man seeks stability in his relations with customers, suppliers, and competitors he is evidently aiming at future profits. Some economists claim this is an attempt to maximize long run profits, while others like Professor Reder claim this is simply an attempt to assure satisfactory profits at the present time and in years to come.

Professor R. A. Gordon. Professor Gordon contends that business firms do not determine price and output policy on a marginal type of reasoning, but according to an average cost standard. He believes that conventional price theory has held to unnecessarily unrealistic assumptions. He sums up the assumptions behind the marginal theory as follows:

> 1. The business man always seeks to maximize profit.
> 2. Profits are maximized through adjustments in (usually) only one direction - output.
> 3. Changes in data occur sufficiently infrequently for business men to evaluate results in each new situation and react accordingly.
> 4. The effects of dynamic uncertainty can be ignored.[1]

The first assumption above has been criticized by many writers. Professor Gordon feels that satisfactory profit is a more accurate description of the primary objective than maximum profits. He agrees with Professor Reder when he says that the liquidity solvency motive, or fear of bankruptcy, or fear of temporary

---

[1] Gordon, op.cit. p. 271.

financial embarrassment, are probably more powerful drives than the desire for absolute maximum in profits. This is seen in the business world when a manager may incorporate cost saving processes only when he sees his profits melting away. Professor Gordon has noted among top executives the "banker mentality" leading to the sacrifice of probable profits for the sake of an impregnable financial position. Whether or not this impregnable financial position can be built up without doing all possible to maximize profit, Professor Gordon does not say.

The second assumption, as he has stated it, also needs careful scrutiny. Too often the marginal theory is expressed in terms of an adjustment in output to a fixed demand. This is a result of the theory originating under assumptions of pure competition. In actual practice, under imperfect competition the business man has many variables he must juggle. Particularly important are his selling costs, which may or may not alter the demand he faces, and his product differentiation.

Professor Gordon believes the third of the above noted assumptions behind the marginal theory is also unrealistic. Changes in the business world are continuous, and a businessman cannot adjust to each change as it comes. The factor which complicates the adjustment most frequently is that most firms produce more than one product. In most cases of multi-product production the goods are not joint cost goods, but should be called common cost goods. Joint cost goods are those which are produced with the same cost of production--one cannot be produced alone. Common cost goods are those which can be produced separately, and have

some separate costs and some costs in common such as overhead of the factory. Determination of marginal cost in this case is far from a simple matter of adjustment to a single change. An increase in the rate of production of any one of a number of goods, will make imperative the readjustment of costs of all goods. At the same time, labor is usually applied in a sequence of steps and some of these operations may be expanded easily (excess capacity) and some only at heavy expense (bottlenecks). Attempts to apply marginal type analysis here would lead to hopeless complexity. Professor Gordon agrees with the Conference on Price Research when they conclude regarding the multi-product case, that whatever the basis of estimating marginal cost actually used, "it is not ordinarily the ascertainable incremental cost of a separate product which sets the limit below which a firm will not sell, but rather this plus some share of the common cost."[1]

One of the most critical weaknesses of conventional price theory probably lies in the assumption concerning a business man's knowledge of his demand situation. Firms apparently in the same market category often have wide divergence in their demand situation. For example a shift through time will greatly alter a demand. First, the demand for a new product may be very great. Second, after partial satiation of this demand the business man faces a different situation. Third, the demand in a saturated market will be still different. There is also the influence on

---

[1] Committee on Price Determination for the Conference on Price Research, Cost Behavior and Price Policy, New York, National Bureau of Economic Research, 1943, p. 178.

demand of product differentiation, installment buying, used product market control, and control of retail sales outlets. Most important of all the influences on demand, perhaps, is the action of competitors which in most cases is unpredictable. Competitors' price changes, advertising campaigns, and product changes may completely alter a demand without notice.

With the multitudinous and ever-changing factors influencing demand, it is not surprising that the average business man does not know how sales would vary at different selling prices.

Professor Gordon's main conclusions are that business men cannot determine price and output on a marginal basis because of "unending and unpredictable change and the existence of more directions of adjustment (variables to be manipulated) than the business man can possibly handle in the manner assumed by formal theory."[1]

Professor Wilford J. Eiteman. Professor Eiteman likewise disagrees with the contention of the marginal theorists that equating marginal cost and marginal revenue is a business man's method of conducting his business. He says that marginal output is (by definition) the increase in total output that results from the application of one more input unit. In a multi-process industry, even the simplest practical application of marginal analysis is too complex to constitute a working guide in practice. He uses the following example to illustrate some of the difficulties

---

[1] Gordon, op.cit. p. 283

involved in applying the orthodox analysis to multi-process industry:

> Assume that three men working a full day in Department A of a plant are able to complete the first manufacturing step on 12 products. Assume that the 12 products then pass into Department B where two men work on them for another day before they pass into Department C to be completed by the work of one man for still another day. Thus once production is under way, the daily output of the plant and its six workmen is 12 finished products.[1]

Professor Eiteman says that the procedure for determining marginal product is to withdraw a unit of input and note the effect upon total output. In his example, if a unit of input is withdrawn the result on output varies a great deal depending upon which unit of input is withdrawn. If one man from Department A is withdrawn, total output decreases by four units. One withdrawn from Department B causes a decline of six in total output, and the withdrawal in Department C results in the loss of the total output of the plant.

Professor Eiteman concludes that under such circumstances,

> It is absurd to claim that entrepreneurs strive consciously or unconsciously to expand their scale of operations until marginal costs equal marginal returns. As a matter of fact, the concept of marginal output is foreign to the thinking of the average plant manager, possibly because the simplest practical application of marginal analysis to multi-process industry is too complex to constitute a working guide in practice.[2]

The scale of operations for a plant is determined to a large extent by cost figures as prepared by cost accountants. When aggregate overhead cost remains fairly constant from month to month and there is no change in the market prices of labor and materials,

---

1 Eiteman, op.cit. p.282.
2 Ibid. p. 284.

unit costs computed by actual cost methods exhibit a tendency to vary inversely with output. Hence, most managers are convinced that increases in the scale of plant operations always lead to lower unit costs. That is to say, they do not recognize the possibility of a stage of increasing average costs intervening before capacity output is reached. How Professor Eiteman uses the term "capacity" output is not entirely clear, but in this instance he apparently intends to refer to the largest output possible without increasing the size of the plant, (without increasing overhead).[1]

According to this reasoning there are two practical ways for plant managers to lower unit costs. The first is to push aggregate annual production beyond "normal" in order to achieve lower overhead costs per product. Whether this is possible or not depends primarily upon the success of the sales program. The second is to discover labor-saving devices and methods by means of which fewer men in one or more departments will be able to produce the same output.

> Attempts to increase profits by varying the number of men employed, in the hope of equating marginal cost to marginal returns, are not likely to be considered by the manager of a multi-process industry, because the problems of departmental synchronization there-by created dwarf considerations of marginal efficiency.[2]

Professor R. A. Lester. Professor Lester conducted an

---

[1] For further information see W. W. Haines, "Capacity Production and Least Cost Point", American Economic Review, 38:617-624 September, 1948.

[2] Eiteman, op.cit. p. 286.

empirical study attempting to discover how important wage rates were in determining the volume of employment. His conclusions were that most business executives do not think of employment as a function of wage rates, but as a function of output. Thus he pointed out the shortcomings of marginal analysis for wage and employment problems.

His study consisted of sending out questionnaires to different types of business firms asking them to rate several factors in the order of their importance in determining the amount of employment in their respective factories. The list to be rated was as follows:

A. Present and prospective market demand
B. Level of wage rates or changes in level of wages
C. Non-wage costs
D. Variations in profits or losses of the firm
E. New techniques
F. Other factors (please specify)[1]

The results of his survey showed that the business men answering his questionnaire overwhelmingly rated the present and prospective market demand as the most important factor. Since marginal analysis claims that firms adjust the number of men employed to the point where marginal productivity (units of production added to total output by one additional laborer) is equal to the wage rate, the conclusion of Professor Lester was that marginal analysis did not apply to wage and employment problems.

Further evidence disproving the marginal theory was presented by Professor Lester. He found that 36 of the 43 firms answering

---

[1] Lester, op.cit.

his questionnaire stated that they would respond to a worsening of their competitive position by increasing efficiency, which would appear to mean they were operating at less than top efficiency, hence not maximizing profits.

Alternatives to the Marginal Theory

There appear to be two principal alternatives to the marginal theory. Professor Gordon contends that the average cost pricing principle is a more logical explanation of business behavior. His theory is that a business man bases his prices on average cost plus the conventional mark-up for his particular industry. This assures the firm of long run solvency and satisfactory profits, (provided the goods will sell at that price). When attempting to determine average cost, an executive must first assume a particular output, which in turn is dependent upon the price he is attempting to determine. Even under monopoly a firm cannot set both price and the quantity sold at that price. One or the other is determined by demand. Professor Gordon avoids the circularity of this reasoning by assuming that a firm will consider its demand to remain constant for the new price quotation period and figure the costs on the quantity of production this demand would bring forth at the previously quoted price.

Another alternative to the marginal theory which has been presented is the turnover theory of Professor Wilford J. Eiteman. Professor Eiteman claims that business men watch their inventory levels as an indication of whether or not their production and pricing policies are at a point where profits are a maximum.

If an inventory of finished goods begins to increase, the producer knows he must either cut back production or reduce prices. Conversely, if inventories drop, prices can be raised, or production increased. This theory does not take account of either marginal or average costs, and for this reason it apparently has not been very widely accepted by other economists. Most present day economists seem to feel that costs, either marginal or average, are the basis for business pricing policies.

There follows a more detailed account of these alternative theories.

Turnover Theory. Professor Eiteman has not merely refused to accept the marginal theory as applied to actual business practice, but he has presented an alternate theory which he feels more adequately describes business behavior. This theory is based on the premise that the operation of an enterprise consists of a series of turnovers of working capital, rather than combinations of fixed and variable costs.[1]

Each turnover results in a gross profit when the goods are sold at a mark-up. Continuous operation is obtained by using several units of working capital at the same time. A larger return for the money invested will be gained by turning one or two units many times during the year than by having, say, six units and turning each only one time during a year. This is one basis of his contention that business men believe that profits are increased by producing as near to capacity output as possible.

---

[1] Wilford J. Eiteman, Price Determination, Business Practice versus Economic Theory, Ann Arbor, University of Michigan Bureau of Business Research, Report No. 16, 1949, 39 p.

Inflowing cash is divided into two funds, one to replenish working capital and the other to be available for other purposes. These other purposes are divided into three groups. One is obligatory payments such as rent, interest, and taxes. A second group is composed of those costs which can be postponed temporarily such as replacement and repairs of capital equipment. The third fund is discretionary, meaning it can be spent at the discretion of the management. It might go for expansion purposes, advertising appropriation, or payment of dividends on preferred or common stock.

Conventional theory shows expansion as an application of additional input units (variable factor). Professor Eiteman agrees that expansion can occur in this fashion, but it would be equally possible for expansion to occur by more intensive use of existing working capital.

Professor Eiteman's theory is based on the conclusion that most businesses operate under conditions of imperfect competition. In fact he says, "in reality, modern mechanized industry could not exist under the ideal, perfect competition" of economic theory.[1] The reason for this is the assumption under pure competition that there are a large number of sellers, a number so large that no one seller can influence the price.

Even though Professor Eiteman agrees that business operates under imperfect competition, he does not agree that businessmen restrict output as is so often claimed under marginal theory as

---

[1] Ibid, p. v.

applied to imperfect competition. Business firms have their best financial position in pushing production as near capacity output as possible to increase the number of times capital turns over in a given time period.

Professor Eiteman's theory claims that business firms use their inventory levels as control mechanisms. He means that firms increase or decrease their scales of operation or adjust prices to maintain a given level of inventory of finished goods. For example, the inventory level of the retailer at a particular price may begin to decline, which indicates that consumers are moving the goods off the shelves faster than they are being produced. Retailers could raise their prices, but more probably they will increase their orders from wholesalers because of the belief that profits are increased by faster capital turn-over.

The wholesaler, in turn, can either increase prices to maintain his inventory level, or he can increase orders from the manufacturer. When the manufacturing firm sees the inventory level decreasing, he can either increase price, or increase the scale of operations. If he is already operating at maximum capacity and cannot expand without entailing great additional expense, he may raise prices, but if possible he will increase the rate of working capital turnover by increasing production to keep up with the increased demand at a given price, or he may raise price some and also increase production.

The above theory assumes that the manufacturer set his price in the first place at a level which would cover all costs, with costs figured on an output which would make minimum reasonable

use of the present facilities of the factory. Professor Eiteman tells us that a producer arrives at a price for a good newly produced by figuring from his costs in this manner:

First, outlays are tabulated for producing different quantities of the product. These outlays consist of (a) fixed - interest, taxes, rent, (b) variable - labor and materials, and (c) those expenditures which vary with executive policy, officers salaries, advertising, etc.

He may estimate costs thus at three different scales of operation as shown in figure 2 below, and establish as his first output objective OX units. This quantity is chosen because it is established as the minimum quantity possible for a satisfactory profit. It is large enough to have lowered average fixed cost, yet not so large that estimated selling expense becomes a burden.

Now from these cost figures, a price is established which at the scale of operations set as the first objective will net the enterprise a reasonable return on the assets essential to production. Suppose it were 10 per cent. Then 10 per cent of total cost, divided by estimated output will give the per-product mark-up over cost necessary to net a reasonable return on investment. The wise manager will make some inquiry at this point regarding the possibility of selling the new product at this price through market survey services or other sources.

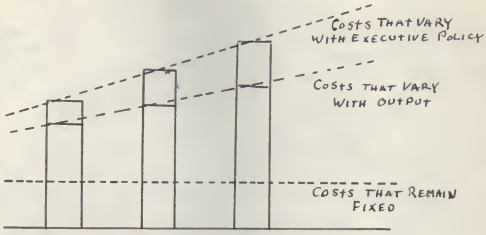

Fig. 2. Individual Firm Cost Analysis

According to Professor Eiteman the demand for a product is not a line indicating that a definite number of goods can be sold at each price. He pictures demand as a zone. For example, if the price is too high to move the quantity of goods being produced, it is because price and quantity are in the inaccessible area as shown on the graph, Fig. 3. The business man becomes aware of this when his inventories begin to pile up.

If production were taking place anywhere in the accessible area, goods would be moving rapidly from the shelves, but it will not be known whether or not the goods would move just as rapidly at a high price unless it were tried.

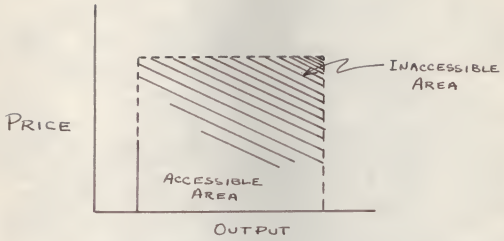

Fig. 3. Individual Firm Demand Analysis

So, to sum up, the business man establishes a price on a cost-plus basis, and then when the good is put on the market at that price, an attempt is made to determine what area of demand is being satisfied, by either holding quantity steady and slowly increasing price until inventories indicate entry into the inaccessible area of demand, or holding price steady and slowly increasing production until inventories begin to pile up. In this fashion a decision is reached as to the maximum quantity of a given good which will sell under the present demand, and the business man will be assured of making all the profit possible under present methods of production, selling expenditure and product variation.

A direct comparison of the marginal theory and his own turnover theory and of their effect on selling price and output has

been given by Professor Eiteman.[1]

In Fig. 4 below let the AC line represent the average cost of production for a producer of a differentiated product. Let the AR line represent both the average revenue curve in the sense ordinarily used in the accepted theory, also called the demand curve, and the mid region of the accessible-inaccessible zone as used in the turnover theory.

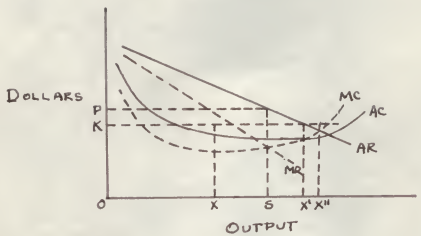

Fig. 4. Comparison of Marginal and Turnover Theories

The conventional procedure would be to draw the marginal revenue line (MR) from the AR line given, then draw the marginal cost curve MC from the AV curve given. The intersection of MR and MC curves indicates the firm's most profitable output according to marginal theory, and a price of OP would be charged. Sooner or later, consciously or instinctively, a skilled intrepreneur

[1] Ibid, p. 34.

will guide his enterprise to this equilibrium point according to the marginalists.

According to Professor Eiteman's turnover theory the firm might let OX represent the minimum reasonable use of the plant available. Let OK represent cost of production at OX plus a reasonable return on the total investment required. Hence OK becomes the advertised price and OX becomes the first objective. When production reaches OX, goods are moving promptly through the channels of distribution (for the inaccessible area lies far above) so expansion of output is indicated. When expansion reaches OX' inventories will show a slight tendency to mount. At an output of OX'' the tendencies of inventories to mount will reach alarming proportions. This tendency of inventories to mount will disappear whenever output is reduced to OX' or slightly less. Hence, with a price of OK an equilibrium will be reached at or near OX'.

Under conventional theory, price is OP; under the inventory theory it is OK. According to the conventional theory, output will be stabilized at OS; according to the new theory it will be stabilized at OX'. Thus from the same data and under identical assumptions, the alternative theory suggests that output will be greater and prices will be lower than they will be according to the marginal theory under imperfect competition. It is possible, of course, to get different results by assuming different cost and revenue curves (or zones) but the fact of importance is that the two theories do not lead to identical solutions of a given problem.

In general the turnover theory will result in lower prices

and larger output than the conventional theory. This increase would seem to indicate that society obtains more goods at lower prices than would be secured if businessmen actually restricted output as claimed by the marginalists.

It may be argued that the turnover theory causes a producer to operate at a point other than the most profitable one possible. This is admitted but it should be pointed out that the producer is operating at a point which he thinks is most profitable, because as stated before, business men contend the faster the capital turnover, or the greater the volume of sales, the more profit will accrue.

The question may be raised why a producer after having expanded to OX' would not contract his output to OS and find experimentally that this point is more profitable. Professor Eiteman claims that to do so would mean raising prices. To raise prices in a manner to maximize profits, the businessman should follow the path of the AR or demand line. This latter can be accomplished by an economist on a blackboard illustration because he assumes that he knows the AR line's pattern, but in the world of reality, where businessmen operate, the AR line or zone is constantly shifting. Even if the zone remained fixed, as assumed in the preceding analysis, its location and slope are not known to a businessman. Thus he is forced to make decisions on the basis of information available to him. This, according to Professor Eiteman, is limited to average cost data and information relating to his turnover.

Average Cost Theory. Most of the economists who have criticized the marginal theory prefer to think that average cost more closely describes the principle behind actual business pricing behavior. Average cost plus a percentage mark-up for profit is the accountant's ideal, not only because it uses numerical data available to him, but because it assures the long run solvency of the business. Also average cost may be a defense of any price set. Charges of monopolistic pricing practice cannot be maintained if it can be shown that price is based on cost figures plus a normal mark-up.

Professor Gordon feels that a business man is more concerned with a changing volume of sales at a given price, once that price is set, than he is in adjusting price to an unknown demand at an output established by an unknown marginal cost and marginal revenue.

He says that most firms have a price-quoting period of a month, a season, a year or more. At the beginning of this period price is determined along with estimates of sales. Then the business man considers a range of possible output combinations at that price. Changes in product specifications, production techniques and the nature and amount of selling effort will also be considered.

The price quotation period is planned in the light of some feasible long-run objective, which may be satisfactory profits and a safe financial position, as mentioned above. Business men must pay attention to the state of the market and also emphasize average cost in pricing decisions because average cost is a good

guide to long-run solvency. However, the use of output, which in turn (unless demand is infinitely elastic) requires the assumption of some price figure, appears to be circularity of reasoning.[1] However, Professor Gordon says the problem is solved by determining output for a particular time period, perhaps the past price quotation period. This may be taking as a guide the average cost of an output different from that which is actually sold.[2]

> However, a norm period as a basis for pricing is often used because very often the demand which is faced may be different than expected or than previously prevailing. This new situation must be assumed to continue for some considerable time, before a new norm for determining average cost will be taken.[3]

Theory of Games. A very important influence on a firm's decisions will be the anticipated or observed behavior of competitors. In this connection Professors vonNeumann and Morgenstern have developed what they call the "Theory of Games and Economic Behavior" wherein they attempt to solve the problem of determining rational economic behavior on the part of an individual when the very rationality of his actions depends on the probable behavior of other individuals.[4] They compare his situation to that

---

[1] For further information see William Fellner, "Average Cost Pricing and the Theory of Uncertainty", Journal of Political Economy, 56:249-252, June 1948.

[2] Henry M. Oliver, Jr. "Average Cost and Long Run Elasticity of Demand", Journal of Political Economy, 55: 212-221 June 1947 "Marginal theory provides no escape from the circularity of reasoning that average cost depends upon price, while price depends upon use of average cost as a criterion of demand-elasticity."

[3] Gordon, op.cit. p.279.

[4] John vonNeumann and Oskar Morgenstern, Theory of Games and Economic Behavior, Princeton, Princeton University Press, 1944. 641p.

found in games of chance, with the most likely results of any situation worked out by a system of probabilities.

Defense of Marginalism

The marginal theory has been stoutly defended against these attacks by its adherents. Bearing a heavy share of the burden in the current controversy is Professor Fritz Machlup.

Professor Machlup says that the marginal theory is the logical outcome of the profit maximization principle. He admits that the essential terms in which economists explain business conduct, such as demand curves, marginal revenue, and marginal cost do not exist in the business man's vocabulary. However, he claims this does not prove that the explanations are unrealistic or false. Their mental processes follow this reasoning even though the language is foreign to them. There is only one method a business man may use to be sure of maximization of profits, and that is to equate marginal cost and marginal revenue.

Professor Bain has said that sellers are

> not inclined to make highly complicated calculations with highly uncertain data, as would be necessary in complete marginal analysis, but would be more rationally expected to employ various simplified formulae and approximation methods in arriving at a desirable price and output.[1]

These "simplified formulae" would take the form of marginal analysis even though they could not have numerical definiteness. Business men cannot use accounting data which refer to the past

---

[1] Joe S. Bain, "Price and Production Policies", Survey of Contemporary Economics, Garden City, N. Y., Country Life Press, 1945, p. 155.

because marginal cost and marginal revenue concepts refer to expectations of future conditions. There is a subjective character to these estimates as each executive conducts his business guided by his own appraisal of expected future conditions.

Professor Bain quotes Mr. E. G. Nourse as saying that price and output policy in any situation is not determinate, because there is a broad scope for creative decision-making by the executive. "Different persons, each desiring to maximize profit, might act in different ways in the same objective situation."[1]

Professor Machlup admits that often times the business man's behavior may be non-rational, or motivated by extra-economic objectives. Sometimes the business man's actions may be blindly repetitive, or too overpowered by tradition to attempt maximization of profits. For example, there is the role of past history of the firm which plays an important part in determining the product, output, employment, and prices. "The role of the past in the process of adjusting the present to the anticipated future is essential in all theory of human conduct" and is not denied by marginal analysis.[2]

Often business men's actions become "routine", meaning they are based on principles which were once considered and decided upon and have then been frequently applied. The feeling that calculations are not always necessary is usually based upon an ability to size up a situation without reducing its dimensions to definite

---

[1] Ibid, p. 156.

[2] Machlup, op.cit. p.550.

numerical values.

Actions which are routine or repetitive, however, would fall outside the considerations of the marginal controversy, and in no way invalidate the profit maximization principle, according to Professor Machlup.

Another factor often used to show that business men analyze situations differently than by marginal cost and marginal revenue is the non-pecuniary considerations. For example, producing a larger output, paying higher wage rates, or charging lower product prices than would be compatible with a maximum of money profits may involve for the business man a gain in social prestige, or a certain measure of inner satisfaction.[1] One could include these psychological incomes and costs as part of the marginal analysis, but this would be giving a very broad and vague definition to maximum profits, making it almost a synonym for individual happiness. Professor Machlup prefers to keep marginal analysis on a pecuniary basis and to consider factors which cause business men to act in ways which do not conform to the profit maximization principle separately. He prefers to separate non-pecuniary factors of business conduct from those which are regular items in the formation of money profits.

Professor Machlup does not feel that economists who have conducted empirical research on the single firm in an effort to invalidate the marginal revenue-marginal cost theory have in any

---

[1] For further information see: George Katona, "Psychological Analysis of Business Decisions", American Economic Review, 36:44-62, March, 1946.

sense accomplished their purpose. He says that empiricists are often guilty of a naive acceptance of business men's rationalizations in lieu of genuine explanations of action.

One of the conclusions of empirical research is that business men follow rules of pricing on the basis of average cost calculations even where this is known to be inconsistent with profit maximization. There appear to be a number of reasons for this. First, selling at a price higher than justified by average cost plus a fair profit might indicate monopoly. Second, selling at less might indicate a price squeeze on competitors. Since the business man wishes to avoid both of these, he justifies his price on the average cost basis. At times the fair profit margin is wide and at times narrow, but this seems to have escaped the empiricists who still claim average cost is the basis for the price. If profit margins are not steady, Professor Machlup claims that pricing decisions are based on some other factors than a simple average cost. The business man may not be conscious that the average cost explanation is merely a rationalization or justification, nor apparently is the empirical investigator.

Average cost pricing is the accountant's ideal. Selling price must cover average cost inclusive of overhead and a fair profit margin, if the business enterprise is to live and to prosper. If accountants think the marginal cost principle will result in losses, it is because they have failed to understand fully the marginal theory according to Professor Machlup. He points out first that marginal cost need not be below average total cost.

Marginal cost may equal or exceed it, particularly for volumes of output at or beyond "optimum capacity" of the firm. But even if marginal cost policy should not yield a profit, by the nature of the analysis, the output indicated by the intersection of marginal cost curves and marginal revenue curves would be less unprofitable than any other policy. Second, to use marginal cost as a pricing factor need not mean that price will be set at the marginal cost level. Price is determined, according to the conventional theory, by the demand or average revenue curve. Professor Machlup says,

> In the exceptional case of pure competition price cannot be 'set' at all, but is 'given' to the firm and beyond its control and marginal cost will be equal to price, not because of any price policy, but only because of adjustments in the firm's production volume.[1]

Under conditions of imperfect competition, marginal cost is used to determine the most profitable output, this always being where marginal cost intersects marginal revenue. The price is determined by the demand or average revenue curve and for most outputs this falls above the marginal cost curve.

On the basis of marginal analysis of the firm and the industry price in the long run would not deviate too much from average cost. The reasons for this are that a lower price in the long run would not give enough return for the firm to continue in business, while a price very much higher would attract new firms into the industry which would tend to reduce the price again. This, however, does not mean that a firm uses average cost as its pricing basis, because most business men would attempt to get better prices

---

[1] Machlup, op.cit. 541.

when they could safely get them, and would not refrain from reducing prices if by doing so they would minimize a loss (more closely approach MC = MR).

Professor Machlup claims that because the margin above average cost is different from firm to firm and within a firm from period to period and from product to product, other data besides, or instead of, average cost is evidently consulted. One factor which Professor Machlup claims greatly influences business decisions is the elasticity of the demand for the product. Demand elasticity is the determinant of marginal revenue, so that when a business man is concerned with demand elasticity he is really concerned with marginal revenue.

Professor Machlup quotes from an inquiry by Professors Hall and Hitch as to why business men did not charge a higher price or a lower price.[1] Of twenty four firms, seventeen stated that it was fear of competition or potential competition and a belief that others would not follow an increase which kept them from charging a higher price. Another two stated they preferred a large turnover. These business men were estimating the risk of losing business if they raised prices. In other words, they were concerned about the elasticity of demand.

In determining why business men did not charge lower prices, Professors Hall and Hitch reported nine firms said that demand was unresponsive to price and eleven firms stated that their competitors would follow their price cuts. From this also, it appears

---

[1] Ibid. p.547.

that the business men pay much attention to demand elasticities, which to the economist is equivalent to marginal revenue considerations.

Apart from the absence of numerical estimates, Professor Machlup concludes that the Hall and Hitch inquiry in no way invalidated the marginal theory.

In discussing Professor Lester's study, Professor Machlup says the business men were asked to rate the "importance" of several factors determining the volume of employment for their firm. No explanation was given whether this importance of the variable should refer to (a) frequency of variations, (b) extent of variations, or (c) effects of its variation. What it is necessary to know, however, Professor Machlup indicates, is the effect of variation of each factor separately, while the others remain unchanged. He points out that the first - present and prospective market demand - unquestionably excels all others in frequency and extent of variations, and it won first prize in Professor Lester's importance contest. All except the item marked "other factors" and the all-inclusive, "variations in profits or losses of the firm" are essential variables of the very analysis which he means to disprove. The prize winning item, market demand, is certainly a most crucial determinant of marginal productivity. Professor Machlup fails to see how Professor Lester came to think the results of this poll would in any sense disprove or shake marginal productivity analysis.

The general conclusions reached by Professor Machlup after consideration of these empirical studies, are that the marginal

theory of business conduct of the firm has not been shaken, discredited or disproved by empirical tests. He does not accept empirical results gained by the use of mailed questionnaires because he says reasons given by business men for past action are apt to be rationalized unconsciously to conform with what he thinks the interrogator would approve. "Only through detailed discussions of different situations, actual as well as hypothetical, will an investigator succeed in bringing out true patterns of conduct of the individual business man."[1]

[1] Ibid. p. 538.

CASE STUDY--VIKING MANUFACTURING COMPANY

Aim of the Enterprise

Question. What would you consider the Viking Manufacturing Company's primary aim to be?

Answer. President: To build up a solid dealer organization with friendly relations and to earn the goodwill of the farmer trade for Viking Equipment in order to give the company future stability.

Vice President: To establish a line of higher quality, labor saving farm machinery in the field of feed preparation and handling. Viking Manufacturing Company is not a speculative enterprise desiring high profits now, but is interested in steady growth and future profits.

Question. Have you ever actually given up a modicum of profit in order to build up clientele?

Answer. Yes, whenever there is a machine failure in the field and there is any doubt as to whether the farmer or the machine is responsible, Viking always makes service calls and sends replacement parts at no charge to win the goodwill of the farmer and the dealer.

Also, where dealers have had stock unsalable in their area, Viking has exchanged it for other goods they could move, so the dealer never feels "stuck" with any Viking Equipment.

Question. Why wouldn't a concern want to make maximum profits?

Answer. Only if by doing so it decreased its chances for more profits in the future.

Question. Why do you wish to maintain goodwill?

Answer. Goodwill is the means to repeat business which is necessary to maintain future profits.

Question. Do you feel that the farm machinery business in general can make more profit with low price, fast turnover, or with high price slow turnover of production?

Answer. During periods of material shortage a high price and slow turnover is desirable, but when material is plentiful, more money can be made with low price, fast turnover and high volume.

Market Structural Factors

Question. How many sellers are there in the farm elevator market?

Answer. In 1943 when The Viking Manufacturing Company first conceived the idea that the farm trade could use a farm elevator there were 10 sellers in the market. At that time Viking designed and built one elevator, but were unable to go into production because of the war. In 1946 the company began elevator production with Model #10. At that time there were 15 other elevator producers in the market.

At the present time there are about 100 producers in the United States, but these are not all in competition with one another because no one seller covers the whole United States sales area. Of these 100 producers, Viking ranks 6th or 7th in the number of elevators sold during 1950. This information is

obtained from the United States Industrial census which tells the number of elevators sold and the number of manufacturers in the United States.

In the particular area where Viking sells elevators, there are approximately 30 other sellers. Some of these are larger (meaning produce a larger volume of elevators) and some are smaller than the Viking Manufacturing Company.

Question. In what geographic area do you sell?

Answer. Minnesota, South Dakota, Nebraska, Iowa, Illinois, Indiana, Missouri, and Kansas. The freight rates from Manhattan make the price too high in more distant areas to effectively compete with machines manufactured in those areas.

Question. How many buyers are there for your product?

Answer. Viking Manufacturing Company has about 700 dealers in their eight state area. These dealers are the immediate buyers of this product. The total number of buyers of all farm elevators in the area would run into the thousands because there are one, two, or more farm machinery dealers in every town, most of whom carry some make of farm elevator.

Question. Do you consider a Viking Elevator a producers' good or a consumers' good?

Answer. A producers' good.

Question. When will replacement orders begin to be effective?

Answer. The Viking elevator will last at least ten years. Some makes are constructed of cheap materials and only last two or three years. Some of these elevators have already been replaced, and many replacements are with Viking elevators.

Question. Is your elevator differentiated from others on the market?

Answer. Yes, it is a larger size elevator, made with higher quality bearings, chain and other features.

Question. How did you get the idea of producing a high quality machine originally?

Answer. The background of the company was in production of industrial equipment, which is higher quality machinery on the average than farm machinery. This high quality policy carried over into farm machinery production.

Question. Do you have any patented features on your elevator?

Answer. No.

Question. Is there any restriction on new elevator producers entering the market?

Answer. Normally not; however, at present materials are restricted and newcomers would have difficulties procuring steel or aluminum for manufacture.

Question. Why haven't International Harvester Company or Allis Chalmers gone into elevator production?

Answer. It is not known exactly why the larger companies have not gone into elevator production. International Harvester has several models out, some of which incorporate Viking principles, but International Harvester apparently is still experimenting. Perhaps a shortage of manufacturing space or the feeling that the market is not right is the reason. Traditionally elevators have been made by short line manufacturing companies rather

than the large full line companies.

Demand for Viking Elevators

Question. What is your understanding of the term demand?

Answer. President: The demand is the potential market which could be developed for the product by a reasonable sales effort.

Vice President: The number of buyers for the particular type of an elevator.

Question. When you consider demand "the potential market which could be developed", do you have a particular price in mind?

Answer. Not a particular price, but a particular price range. Viking's particular range is in the high priced elevator bracket. $500 to $650. However, at the present time raw material costs would make the $500 price prohibitive.

Question. How different would this "potential market" be at a lower or at a higher price than you now quote?

Answer. The managers felt they would probably be able to sell more at a lower price, if costs would permit a lower price, and probably would sell less at a higher price, but they saw no point in determining the number which could be sold at prices outside their usual range.

Question. Do you feel you would have been able to sell the same number of elevators during 1950 had you charged a higher price?

Answer. During 1950 there were two different demand situations. During January to June they definitely could not have sold any more at a higher price. After June when the war effort became

apparent, Viking did raise the price and sold an increased number of elevators anyway. If the company could have foreseen this increase in demand and stockpiled some elevators in the first half of the year, more could have been sold than were produced in the second half of the year.

Question. Would you have been able to sell any more at a lower price?

Answer. During the first half of the year sales were not as large as expected, a lower price would not have increased sales a great deal. Anyway, costs would not allow a lower price. After the increase in demand a lower price was unnecessary to increase sales, because the company could sell all they could make anyway. The number which could be manufactured was limited because of material shortages.

Question. Why wouldn't a lower price sell more?

Answer. During that period prices were not a factor; farmers were just not buying due to economic conditions. These conditions consisted of a lowering of farm prices and the fact that the initial surge of buying after the war had been completed.

Question. What can you do to increase your potential market?

Answer. It could be increased by a reasonable amount of sustained advertising. However, at the present time advertising would not be feasible because the company could not sell a larger number of elevators due to material shortages.

Question. If you had an inventory of finished machines, would you sell at a price lower than cost to move it?

Answer. It would depend on the time of year. At the end of

the season for elevator sales (the season is May through October) Viking would lower price so as not to have a carry over. At the beginning of the season the company would continue to produce and see what happened. Possibly advertising would be increased.

Question. Do you notice the market becoming sluggish due to saturation of the demand?

Answer. No it is still expanding.

Question. How long do you think it might take to reach this point?

Answer. A saturation point will be reached ultimately. No estimate given as to when that might be.

Question. What gives you the clue as to the extent of the demand for elevators?

Answer. The number of pre-season orders for elevators is one clue. How fast orders arrive during the season is another. Also salesmen's reports as to sales resistance which they meet.

Cost Analysis of the Viking Elevator

Question. Are your costs higher per unit if only a few elevators are produced?

Answer. Yes. As output approaches the "break even" point, (about 100 elevators per month) unit costs decrease.

Question. Is this "break even" point one definite number of elevators produced, or do costs remain constant over quite a variation of output?

Answer. One definite number is the "break even" point. Any additional output beyond this number will yield a profit (at the

price set at the middle of the season in 1950) and any output less will give a loss. The further output is pushed beyond the "break even" point, the higher is the profit per unit.

Question. To what do you contribute this decreasing average cost?

Answer. Spreading the overhead and increased use of specialization.

Question. Is there a limit to continued decreasing average cost?

Answer. Yes, the limit is plant capacity. Capacity production is the largest number of elevators which could be produced with the present capital equipment. (about 250 elevators per month)

Question. What percent of cost at the break even point is overhead?

Answer. Overhead is made up of factory overhead, administration, and sales expense. These make up 31% of cost at the break even point.

Question. How are your costs divided up?

Answer. (1) Material, (2) Direct labor, (3) Factory overhead, (4) General administration expense, and (5) Selling expense.

Question. If production were increased to plant capacity would per unit costs tend to rise due to increased sales costs?

Answer. No. Under the present demand conditions, production costs would go down more than sales costs would increase.

Question. What might be done to reduce costs?

Answer. Viking could use additional equipment in the factory

to help in material handling and processing. Also a semi-redesign of the elevator could be accomplished which would eliminate some material costs and some operations which are now necessary.

Question. Why have these changes not been implemented?

Answer. Due to lack of working capital.

Question. Do you have a definite amount of working capital?

Answer. A lot of working capital is tied up in inventory which is in one of these forms: work in process, raw material, or finished goods. There is also the capital used for payments such as taxes, rent, and interest. However, working capital has always been limited in Viking's operations due to the rapid advance in prices of material and labor during the last five years and due to continual plant expansion.

Question. Could you figure the change in total cost of one additional elevator through the realistic range of elevator production?

Answer. Yes, that could be figured; however it has never been figured for any reason.

Question. How are your wage rates determined?

Answer. By collective bargaining with employees union.

Question. Which of the following factors is most important in determining the amount of employment in the factory? (This list taken from Professor Lester's survey)

A. Present and prospective market demand.
B. Level of wage rates or changes in level of wages.
C. Non wage costs.
D. Variations in profits or losses of the firm.
E. New techniques.
F. Other factors (please specify)

Answer. Present and prospective market demand.

Pricing Analysis of the Viking Elevator

Question. How did you first determine the selling price of this elevator?

Answer. Price was based on cost which was estimated on a level of production in the plant similar to the one they had been operating on for feed grinders. That is a level of production which made full use of the capital equipment and the number of productive workers already hired. (During the six to eight months of elevator production they did not produce feed grinders). At the time elevator production was started 100 elevators per month was the first objective.

The cost build up was as follows:

	per cent
Raw materials) Direct labor) Manufacturing overhead)	69
Advertising	1
Selling expense	10
General administration	10
Profit	10
Selling price	100

Raw material costs were known. Labor costs were estimated. Historically the manufacturing overhead had been equal to the direct labor cost. The figure for these three was divided by 69% giving the 100% figure or selling price.

Question. Did this price adequately cover all costs including interest on capital?

Answer. Yes, it would the way it was figured. However, the company was not able to obtain enough steel to keep production

above the break even point in all months of elevator production.

Question. Did you attempt to compare competitive prices?

Answer. Yes, and found the Viking price was about $125 higher at that time, but demand was great then and the Viking elevator was a better product.

Question. Did you attempt to determine whether the elevator could be sold in sufficiently large volume at that price?

Answer. Yes, by rough estimate.

Question. Do you know exactly what your competitors are asking for their elevators?

Answer. Yes, because the salesmen in the territory immediately send in a report of a competitor's price change.

Question. How much influence does this have on your pricing?

Answer. It has a great deal of influence, because it shows the trend of the general market for elevators. At the beginning of 1950 all prices were lower. Viking Manufacturing Company lowered its price because it was certain that other prices would be lower. It never follows any particular competitor's price, just tries to feel out the general market.

Question. What would be your response if a competitor suddenly cut his prices in the middle of the season?

Answer. This situation occurred in 1949 and Viking's response was to cut its prices also.

Question. To your knowledge, have other sellers ever altered a price because you did?

Answer. Yes, others followed Viking's lead after the middle of the year 1950 in raising elevator prices. Viking is usually

the first product to solicit business for the next season and in this way competitors know the price that will be asked before they set their own prices. Viking is not afraid to have a higher price because its product is a better piece of equipment. Its price is $15 to $20 higher than elevators of the closest quality at the close of business 1950. This is a smaller gap than previously. At one time when the demand for elevators was much greater than the supply was able to fill, the Viking price was $150 higher than some others.

Question. When considering a price cut, do you think your competitors will also cut price, making it necessary for you to cut price again to maintain your advantage?

Answer. The company considers what the competitors will do.

Question. Do you have a price quoting period?

Answer. The price is quoted for one season, meaning one year. The published price list holds good for one year unless there is reason to change it, and the dealer expects some change for the next year.

Question. Explain the circumstances under which you have altered this price.

Answer. In general the price alterations have come about from three different circumstances:

(a) A change in the design of the machine. This has taken place five times. The first elevator was model #10 and the present machine is model #15.

(b) A change in the method of manufacture to reduce costs allowed lower prices to be charged.

(c) Competitors pricing moves, or changes in demand. See schedule below:

Viking Elevator Price Changes 1947-1950

Date	Model Number	Price	Reason for the change.
Jan. 1, 1947	11	$568.20	
Apr. 25, 1947	11	625.02	First estimate on costs too low. This price based on actual operations.
June 15, 1948	12	647.90	Labor and material costs increased.
Jan. 1, 1949	14	647.90	Model change very minor, no price change.
Apr. 4, 1949	14	612.50	Competitors all lowered price and lower price necessary to stimulate sales.
Jan. 1, 1950	14	506.00	Lowered costs and increased capacity. This necessary because lower price needed to stimulate sales.
Aug. 1, 1950	15	531.30	Demand increasing
Sept. 15, 1950	15	565.50	Material cost rose sharply.

Proposed price for 1951 was still higher anticipating still higher material costs. See Fig. 5.

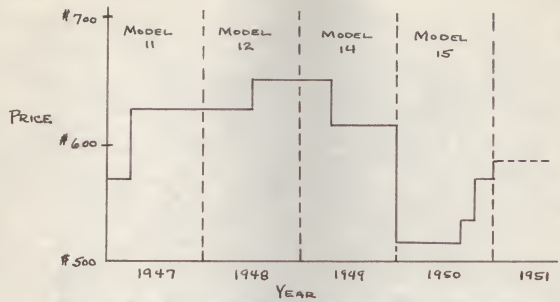

Fig. 5. Viking Elevator Price Changes 1947-1950

Question. Just what are the complications involved in a price change?

Answer. Lowering the price is more difficult than raising it because the dealer will lose on elevators in stock. Viking always tries to lower elevator prices at the end of the season when the dealers are out of stock. There are no other complications.

Question. When considering a price do you mainly consider the dealer's reaction to it, or their customer's reaction?

Answer. The ultimate customer's reaction.

Question. Do you have an "advertised price" for the elevator?

Answer. The price is published in the form of a price list which the dealer can show his customers. This list shows the final sales price less dealer's discount. The dealer pays Viking the discounted price plus freight, and charges his customer the

list price plus freight.

Question. If material conditions had been different, would you have increased output, thus lowering cost, and kept price the same?

Answer. Yes, because satisfactory profits were not being made.

Question. If you figured price on average cost plus, why did you not make that profit?

Answer. Because they did not keep volume of production beyond the break even point and costs were higher than estimated.

CONCLUSIONS

Aim of the Enterprise

One of the principal criticisms of the marginal theory is that it takes into account only one aim of a business firm, and that is the aim of maximum profits.

A number of economists have emphasized that business men claim their aim is satisfactory profit, rather than maximum profits.

The Viking Manufacturing Company also claims that its goal is satisfactory profits and establishment of good will in order to give the firm future stability. This long run goal of good will leading to an excellent reputation in the field would probably give rise to long run maximum profits.

The firm is willing to forego some present profit in order to build up for the future. This is probably partly due to the fact that they are attempting to establish a new product in competition

There is no restriction on entry into the market under ordinary circumstances. This is shown by the fact that elevator producers increased from 15 producers in 1945 to about 100 producers in 1950. At the present time unusual conditions of material shortages would prohibit new producers from entering the market, according to the Viking management.

Each seller has a limited market area, limited by freight rates which would increase elevator prices in distant states too much for them to compete successfully with elevators produced in those states.

Under the market conditions for Viking elevators as outlined, free entry of new firms under ordinary circumstances would soon force all prices down to the cost level. The Viking management apparently is aware of this situation and this may be why part of the aim is to attempt to make the demand for their particular elevator more inelastic.

Demand for Viking Elevators

The management of the Viking Manufacturing Company appears to have a fairly accurate idea of the demand faced. The management does not think of it as a certain number of elevators which will sell at, say, $550 and another certain number at $600 as is assumed by marginal theory and the usual demand curve.

However, Viking does know when the demand faced will allow a higher price, as it did after June, 1950, and they know when the limit of elevator sales at a price has been reached, as was true of the market in the first part of 1950. It would appear that

Viking sees the demand situation much as Professor Eiteman has described it. They can sense when elevator sales are approaching an inaccessible demand area or when sales are well below this area.

The Viking Company does not look at the level of inventory of finished machines as Professor Eiteman claims, because they do not ordinarily stock finished goods. However, the demand situation is sensed by the number of orders for elevators which are received. If orders are arriving daily faster than machines are being shipped, they know sales are in the accessible area of the demand. If orders are not coming in as fast as production, they know sales are approaching the inaccessible area.

Apparently, Viking is only interested in the demand within a realistic range of prices. The management takes into account selling effort and differentiation of the product when considering how many could be sold at any particular price.

Cost Analysis of the Viking Elevator

This firm does not think of costs as divided into two types, fixed and variable, as is claimed by marginal analysis. They divide costs into five divisions: (1) material, (2) direct labor, (3) factory overhead, (4) general administration expense, and (5) selling expense.

Average costs continually decline until "capacity" output is reached. "Capacity" output is defined as the largest output possible with the present capital equipment and factory floor space. The management does not consider what unit costs would be for quantities of production beyond "capacity" because they do not

contemplate producing any quantity in that area. As a matter of fact, Viking has been operating in a steel shortage period ever since their elevator production was begun and they have been unable to obtain steel in large enough quantities to produce up to "capacity".

This firm would conform to Professor Eiteman's statement that business men believe profit is increased by producing as close to "capacity" output as possible. The management believes profit per unit increases the farther beyond the break even point they can push production.

Pricing Analysis of the Viking Elevator

The price of the Viking elevator was first figured from average cost figures. The quantity of output upon which cost was figured was an output which would adequately use the capital equipment and laboring force they had been using to produce feed grinders. This quantity was believed to be their first objective as it was described by Professor Eiteman.

When production was under way, it was found they could not obtain large enough quantities of steel to produce the quantity upon which costs were figured. This is why the first estimate of cost was too low. The price was raised to cover costs, since they could not increase production. At that time, 1947 and 1948, the demand for elevators was very great and they were able to sell all they could produce at the higher price. In 1949 the great demand for farm elevators had begun to diminish and material shortages eased. The Viking management were aware of this and planned to

increase production so they could lower their unit costs to meet the lowered price necessary to stimulate sales.

This indicates that demand is a more dominant factor in determining price than costs.

After the Korean crisis in June 1950, again the management was aware that the demand had increased and because they felt material shortages would soon develop forcing them to produce smaller quantities, thus increasing costs, they raised the price. In this instance, also, the demand gave the impetus to their price change, it was the more influential factor. In other words, even though costs were rising, they could not have raised the price if demand had not also increased.

This apparently conforms to marginal analysis as well as the turnover theory, in the respect that demand sets the price. If a firm cannot adjust output and costs to meet the demand, they will be unable to continue production in the long run.

Summary

The aim of the Viking Company is satisfactory profits combined with anticipated future profits. This could be either a long run projection of the marginal theory's long run maximum profits, or it could be an example of Professor Gordon's claim that business men prefer satisfactory profits and a safe financial position to absolute maximum profits.

This firm did not watch inventory levels as Professor Eiteman claimed, but could sense demand by the number of orders received in one particular production period.

The first price on the elevator was figured according to Professor Eiteman's first pricing theory, based on average cost of a quantity of output which it was thought could be sold. This also conforms to price determination according to the average cost theory. Subsequent price changes, however, indicate that demand is the more dominant factor in price determination. It would appear that demand sets the upper limit on price and average costs set the lower limit if long run solvency is to be maintained.

The Viking management claim they can figure marginal cost, but cannot figure marginal revenue with any accuracy. They have never attempted to figure either one, and so have not attempted to equate them accurately, or by rough estimate, as the marginal theorists claim.

The object of the Viking management is to produce the largest quantity possible because this lowers unit costs through all ranges of production up to capacity. This conforms with Professor Eiteman's theory that business men will produce larger quantities than claimed by marginal theory in the belief that this increases profits.

The demand is influential in determining price, as claimed by marginal theory, but this could also conform with Professor Eiteman's theory. This firm has changed price when it felt that demand called for a price change, instead of altering production as the turnover theory claims, because the company at all times was producing as large a quantity as possible with the amount of steel alloted them.

The general conclusion is that this firm's action more closely approximates Professor Eiteman's turnover theory than any other.

QUESTIONS ASKED IN INTERVIEWS[1]

Aim of the Enterprise.

1. What would you consider the Viking Manufacturing Company's primary aim to be?

2. Have you ever actually given up a modicum of profit in order to build up clientele?

3. Why wouldn't a concern want to make maximum profits?

4. Why do you wish to maintain goodwill?

5. Do you feel farm machinery business in general can make more profit with low price, fast turnover, or with high price slow turnover of production?

Market Structural Factors.

1. How many sellers are there in the farm elevator market?

2. In what geographic area do you sell?

3. How many buyers are there for your product?

4. Do you consider a Viking Elevator a producers' good or a consumers' good?

5. When will replacement orders begin to be effective?

6. Is your elevator differentiated from others on the market?

7. How did you get the idea of producing a high quality machine originally?

---

[1] These questions are framed to conform to answers previously given. This is one advantage of the interview method over a straight questionnaire. Questions can be adjusted to each answer as the interview progresses.

8. Do you have any patented features on your elevator?

9. Is there any restriction on new elevator producers entering the market?

10. Why haven't International Harvester Company or Allis Chalmers gone into elevator production?

Demand for Viking Elevators.

1. What is your understanding of the term demand?

2. When you consider demand "the potential market which could be developed", do you have a particular price in mind?

3. How different would this "potential market" be at a lower or at a higher price than you now quote?

4. Do you feel you would have been able to sell the same number of elevators during 1950 had you charged a higher price?

5. Would you have been able to sell any more at a lower price?

6. Why wouldn't a lower price sell more?

7. What can you do to increase your potential market?

8. If you had an inventory of finished machines, would you sell at a price lower than cost or move it?

9. Do you notice the market becoming sluggish due to saturation of the demand?

10. How long do you think it might take to reach this point?

11. What gives you the clue as to the extent of the demand for elevators?

Cost Analysis of the Viking Elevator.

1. Are your costs higher per unit if only a few elevators are produced?

2. Is this "breakeven" point one definite number of elevators produced, or do costs remain constant over quite a variation of output?

3. To what do you contribute this decreasing average cost?

4. Is there a limit to continued decreasing average cost?

5. What percent of cost at the break even point is overhead?

6. How are your cost analyses divided up?

7. If production were increased to plant capacity would per unit costs tend to rise due to increased sales costs?

8. What might be done to reduce costs?

9. Why have these changes not been implemented?

10. Do you have a definite amount of working capital?

11. Could you figure the change in total cost of one additional elevator through the realistic range of elevator production.

12. How are your wage rates determined?

13. Which of the following factors is most important in determining the amount of employment in the factory? (This list taken from Professor Lester's survey.)

A. Present and prospective market demand.
B. Level of wage rates or changes in level of wages.
C. Non wage costs.
D. Variations in profits or losses of the firm.
E. New techniques.
F. Other factors (please specify)

Pricing Analysis of the Viking Elevator.

1. How did you first determine the selling price of this elevator?

2. Did this price adequately cover all costs including interest on capital?

3. Did you attempt to compare competitive prices?

4. Did you attempt to determine whether the elevator could be sold in sufficiently large volume at that price?

5. Do you know exactly what your competitors are asking for their elevators?

6. How much influence does this have on your pricing?

7. What would be your response if a competitor suddenly cut his prices in the middle of the season?

8. To your knowledge, have other sellers ever altered a price because you did?

9. When considering a price cut, do you think your competitors will also cut price, making it necessary for you to cut price again to maintain your advantage?

10. Do you have a price quoting period?

11. Explain the circumstances under which you have altered this price.

12. Just what are the complications involved in a price change?

13. When considering a price do you mainly consider the dealer's reaction to it, or their customer's reaction?

14. Do you have an "advertised price" for the elevator?

15. If material conditions had been different, would you have increased output, thus lowering cost, and kept price the same?

16. If you figured price on average cost plus, why did you not make that profit?

with many similar products. The future sales of this product depend upon what is called "repeat business", which consists of dealers ordering regularly a certain number of Viking elevators each season because they know farmers will be asking for that particular elevator. When this situation is developed the price charged becomes a less important factor. Thus, the management appears to be attempting to make the demand more inelastic for the Viking elevator.

One other factor may be important in determination of the aim of this firm, and that is pride in a high quality piece of farm machinery. They might have been able to cheapen the elevator in some respects and still sell it at the same price, but they did not do so. The management enjoys being able to point with pride to the Viking equipment which is in the "Cadillac" class for farm machinery.

To sum up, the aim of this enterprise is not short run maximum profits as usually claimed by marginal analysis. The aim is satisfactory profits, so that the firm can have future stability, and a growth in dealer and farmer acceptance of the Viking Elevator.

Market Structural Factors

The Viking elevator is apparently sold in a market characterized by oligopoly. This is clear from the fact that each firm's pricing moves affects prices set by their competitors. The elevators on the market are greatly differentiated, so that price differences will continue in spite of close competition.

ACKNOWLEDGMENT

Grateful acknowledgment and appreciation are extended to the management of the Viking Manufacturing Company for the assistance provided in making this study possible.

The writer expresses special recognition to her Major Instructor, Doctor Edgar S. Bagley, Professor of Economics, for the supervision, helpful suggestions and liberal assistance which he contributed to the study.

LITERATURE CITED

Bain, Joe S. "Price and Production Policies", Survey of Contemporary Economics, Philadelphia, The Blakeston Company, 1945. p. 129-173.

Committee on Price Determination for Conference on Price Research, Cost Behavior and Price Policy, New York, National Bureau of Economic Research, 1943. 353 p.

Eiteman, Wilford J. "Equilibrium of the Firm", Quarterly Journal of Economics. 59:280-286, February 1945.

Eiteman, Wilford J. Price Determination, Business Practice versus Economic Theory, University of Michigan Bureau of business Research, Report No. 16. Ann Arbor, 1949, 39 p.

Fellner, William. "Average Cost Pricing and the Theory of Uncertainty", Journal of Political Economy. 56:249-252, June 1948.

Gordon, R. A. "Short Period Price Determination", American Economic Review, 38:265-288, June 1948.

Haines, W. W. "Capacity Production and Least Cost Point". American Economic Review, 36:63-82, March 1946.

Katona, George, "Psychological Analysis of Business Decisions", American Economic Review, 36:44-62, March 1946.

Lester, R. A. "Shortcomings of Marginal Analysis for Wage Employment Problems", American Economic Review, 36:63-82, March, 1946.

Machlup, Fritz. "Marginal Analysis and Empirical Research", American Economic Review, 36:519-554, September 1946.

Nourse, Edwin G. Price Making in a Democracy, Washington D. C., The Brookings Institution, 1944, 541 p.

Oliver, Henry M. Jr. "Average Cost and Long Run Elasticity of Demand", Journal of Political Economy, 55:212-221, June 1947.

Reder, M. W. "A Reconsideration of the Marginal Productivity Theory", Journal of Political Economy 55:450-458, October, 1947.

vonNeumann, John and Oskar Morgenstern, Theory of Games and Economic Behavior, Princeton, Princeton University Press, 1944, 641 p.

MARGINAL THEORY AND BUSINESS BEHAVIOR
A CASE STUDY

by

MILDRED ERICKSON BUZENBERG

B. A., Michigan State College, 1938

ABSTRACT OF THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Department of Economics and Sociology

KANSAS STATE COLLEGE
OF AGRICULTURE AND APPLIED SCIENCE

1951

At present a controversy is raging among economists regarding the applicability of marginal analysis to business behavior. The assumptions of marginalism have been attacked as unrealistic. In particular, the assumption that firms attempt to maximize profits has been challenged, as well as the assumption that firms can adjust to changes one at a time by a simple adjustment of output to equate marginal cost and marginal revenue. The assault on marginalism is nourished by a number of empirical studies of business practice which have yielded some contrary evidence.

The traditional theory is not lacking for staunch defenders who maintain that it has never been more than a broad general principle which can only be approximated in practice in any case, and that it is still valid in this sense. They deny that the empirical studies have conclusively refuted the theory and question the scientific value of the studies.

Two alternative theories have been presented. One is known as the average cost theory. This theory contends that business men determine prices based on average cost plus a percentage mark-up for profit. The other alternative theory is the turnover theory as outlined by Professor Wilford Eiteman of the University of Michigan. This theory claims that business men consider business as consisting of a number of turnovers of working capital, each turnover netting a return above cost. For this reason, the turnover theory assumes business prefers to produce as large an output as possible, feeling the faster capital is turned over the more profit will accrue.

Through the medium of a case study of a small manufacturing company, it is hoped a conclusion can be reached as to which, if any, combination of pricing theories most closely describes the practice of this one company. The firm which is the basis for the research of this paper is the Viking Manufacturing Company of Manhattan, Kansas. This company manufactures farm machinery and employs from 75 to 100 men and women.

For the purposes of this paper the study will be based upon the farm elevator production of the Viking Company. The case study method employed is one of personal interviews with the management of the Viking Company. The results of these interviews are recorded in a question and answer form.

The results of this survey brought to light several interesting facts about the operation of business in actual practice and the relationship of this practice to economic theory.

1.) Aim of the Enterprise. The Viking Manufacturing Company claims that the goal of the enterprise is satisfactory profits and establishment of good will in order to give the firm future stability. The firm is willing to forego some present profit in order to build up for the future. Hence, the aim of this enterprise is not short run maximum profits as usually claimed by marginal analysis, but is satisfactory profits, so that the firm can have future stability, and a growth in dealer and farmer acceptance of the Viking Elevator. This, however, could be a projection of the marginal theory's long run maximum profits.

2.) Price. This firm figured the first price on the elevator

according to an average cost analysis. Subsequent price changes, however, indicate that demand is the more dominant factor in price determination. It would appear that demand sets the upper limit on price and average costs set the lower limit if long run solvency is to be maintained.

3.) Cost and Output. The Viking Management claim they can figure marginal cost, but cannot figure marginal revenue with any accuracy. They have never attempted to figure either one, and so have not attempted to equate them by rough estimate as the marginal theorists claim.

The object of the Viking Company is to produce the largest quantity possible, because this lowers unit costs through all ranges of production up to "capacity". This conforms to Professor Eiteman's theory that business men will produce larger quantities than claimed by marginal theory in the belief that this increases profits.

4.) Demand. The demand is influential in determining price, as claimed by marginal theory, but this could also conform to Professor Eiteman's theory. This firm has changed price when they felt their demand called for a price change, instead of altering production as the turnover theory claimed, because they were at all times producing as large a quantity as they could with the amount of steel alloted them. However, had the material situation been different, they would have increased production when demand increased rather than change price.

5.) Conclusion. The general conclusion is that this firm's action more closely approximates Professor Eiteman's turnover

theory than any other.